



Early Detection Monitoring of Invasive Plants

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Session Outline

- Invasive species early detection overview
- KLMN progress report
- Species lists and prioritization
- Early detection modeling
- Protocol development time line
- Tasks ahead
- Discussion and potential for transfer
- Monitoring objectives?



Invasive Species

- 1) alien to the ecosystem under consideration *and*
- 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

(NISC 1999)



Comprehensive Invasive Species Monitoring



Prevention

Early Detection

Trends

Efficacy of Management Actions

Secondary Effects of Actions

Restoration / Recovery

8 Steps to Optimum Early Detection

Step 1. Develop a list of target species + resources. Prioritize.

Step 2. Assemble known information.

Step 3. Risk of occurrence model (GIS)
(using Step 2).

8 Steps to Optimum Early Detection (cont.)

Step 4. Develop an optimal search strategy (survey design).

Step 5. Use search model to direct search efforts.

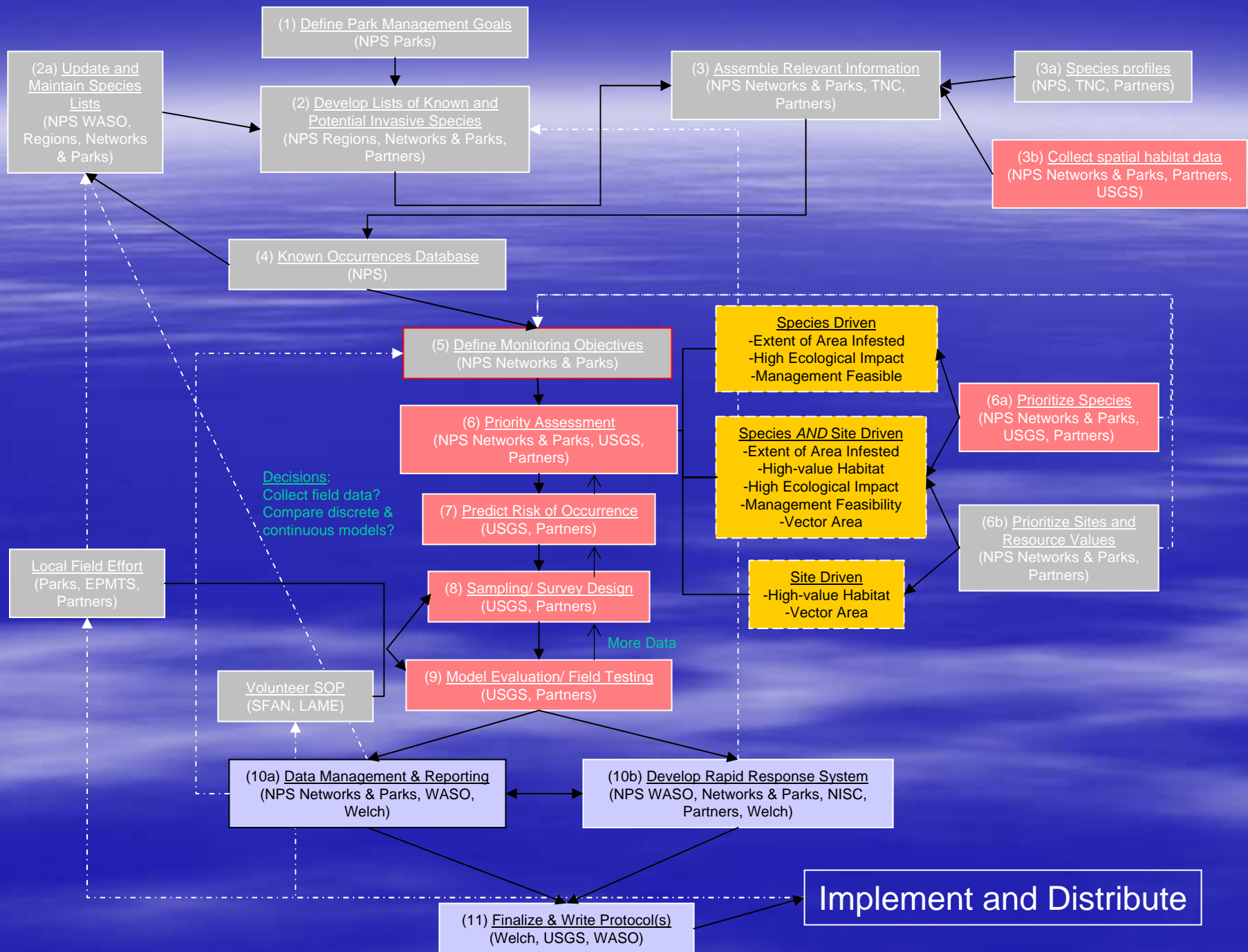
Step 6. Record results and provide feedback.

8 Steps to Optimum Early Detection (cont.)

Step 7. Analyze and report results.

Step 8. If one of the target species is found and cannot be controlled immediately, make arrangements for control efforts.





Invasives Monitoring Research

Early Detection Research Components*	Target Species List				Invasive Species Profiles				GIS / Spatial Data				Known Occurrences Database				Species Prioritization				Site and Resource Prioritization				Imperfect Detectability				Habitat (Species) Models**				Community (Invasibility) Models				Spatially-explicit Models***				Remote Sensing				Identify Invasion Pathways				Bioclimatic Envelope Approach (Regional)				Statistical Models				Risk Analysis				Sampling Design / Strategy				Adaptive Sampling				Incorporate Incidental Reporting				Implement Sampling				Field Validation				Computer Simulation				Software Creation and / or Documentation																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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*Categories are NOT mutually exclusive.

**Most habitat models are GIS-based except for Edwards et al. who have a non-spatial habitat modeling component.

***Most of the spatially-explicit models are GIS-based element distribution models or, at least, linked to a GIS.

?=adaptive sampling will be considered among several alternatives.

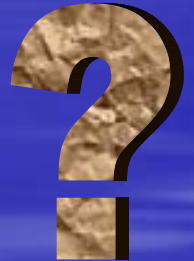
Other NPS Efforts

- NCPN – long-term efficacy (restoration)
 - LAME
 - NCPN
 - SFAN
 - WASO –status and trends, effectiveness, database
- } Volunteer Programs



Other Questions to Consider

- Rapid alert and response system—coordination I&M, EPMTs, Fire, Maintenance, Interpretation, etc.
- Data collection / databases—NPS Service-wide discussion via BRMD and I&M



Early Detection Specifics

- Daniel Sarr-KLMN progress report
- Matt Brooks et al.—Prioritization
- Tom Edwards et al.—Modeling